

REMARKS

The drawings 1A and 2-4 are objected to because they are not legible. In response thereto, Applicant has provided replacement drawings.

Claims 1, 3, 11, and 13 are rejected under 35 USC §102(a) as being anticipated by Lim et al., WO 02/25338.

Independent claim 1 is directed to a microphotonic device that includes a flexible membrane structure that can experience strain. A waveguide element is formed on the flexible membrane structure so that when the flexible membrane structure is strained, the waveguide element is tuned to a selective amount.

Lim et al. '338 describes techniques for tuning, switching or modulating, or, in general, changing the resonance of waveguide micro-resonators. Changes in the resonance can be brought about, permanently or temporarily, by changing the size of the micro-resonator with precision, by changing the local physical structure of the device or by changing the effective and group indices of refraction of the mode in the micro-resonator.

The designs shown in Lim et al '338 are not on a flexible membrane structure. They are attached onto a substrate and the stress field applied from the strain element. Importantly, the present invention shows the usage of a flexible membrane in order to tune various microphotonic elements. Therefore, Lim et al '338 does not anticipate either of claims 1 or 11.

As to claims 3 and 13, they are dependent on claims 1 and 11, respectively. Therefore, claims 3 and 13 are also allowable for the same reasons argued with respect to claims 1 and 11.

Claims 1, 5-7, 10, 11, 15-17, and 20 are rejected under 35 USC §102(a) as being anticipated by Matsuura et al., WO 02/10843 A2.

Matsuura et al. '843 describes a photonic crystal and a photonic device having a photonic crystal, configured by changing its physical geometry in at least one region to alter light propagation and/or confinement. The configuring means may include electrostrictive, piezoelectric or magnetostrictive components of the photonic crystal, or an actuation device affixed to the photonic crystal.

However, Matsuura et al. '843 discusses photonic crystals and supports which have piezoelectric effects. The present invention has photonic crystals and microphotonic elements that do not exhibit piezoelectric effects, and are furthermore not bonded to the supports that exhibit piezoelectric effects. The flexible membrane structure comprises a semiconductor material without requiring the need for piezoelectric effects. The requirement is that the piezoelectric materials are attached to the membrane structure, and the flexibility of the membrane. The top portion of the membrane includes multiple microphotonic elements. Therefore, Lim et al '338 does not anticipate either of claims 1 or 11.

As to claims 5-7, 10, 15-17, and 20, they are dependent on claims 1 and 11, respectively. Therefore, claims 5-7, 10, 15-17, and 20 are also allowable for the same reasons argued with respect to claims 1 and 11.

Claims 4 and 14 are rejected under 35 USC §103 as being unpatentable over Lim et al. '338 in view of Scheuer et al., US 2004/0008942.

Scheuer et al. '942 describes a resonator structure comprising a closed loop resonator waveguide having a width varying over the circumferential region of the resonator waveguide.

Given that claims 4 and 14 are dependent on claims 1 and 11, the reasons argued for claims 1 and 11 are also applicable here. Also, Scheuer et al. '942 does not address the deficiencies of Lim et al. '338. Therefore, the proposed combination of Lim et al. '338 and Scheuer et al. '942 does not render obvious claims 4 and 14.

Claims 8, 9, 18 and 19 are rejected under 35 USC §103 as being unpatentable over Matsuura et al. '843.

Given that claims 8, 9, 18 and 19 are dependent on claims 1 and 11, the reasons argued for claims 1 and 11 are also applicable here. Also, the additional limitations of claims 8, 9, 18 and 19 further limit the inventive concept not taught by Matsuura et al. Therefore, Matsuura et al. '843 does not render obvious claims 8, 9, 18 and 19.

In view of the above amendments and for all the reasons set forth above, the Examiner is respectfully requested to reconsider and withdraw the objections and rejections made under 35 U.S.C. §§§ 102 and 103. Accordingly, an early indication of allowability is earnestly solicited.

If the Examiner has any questions regarding matters pending in this application, please feel free to contact the undersigned below.

Respectfully submitted,

Matthew E. Connors
Reg. No. 47,259

Matthew E. Connors
Registration No. 33,298
Gauthier & Connors LLP
225 Franklin Street, Suite 3300
Boston, Massachusetts 02110
Telephone: (617) 426-9180
Extension: 112